

MICROTONALITY IN INDIAN MUSIC: MYTH OR REALITY?

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Abstract

Microtonality (shruti) is regarded as an essential and core aspect of the raga performance in Indian art music. In fact, musicians invariably refer to and rely on specific intonations as an identifying feature for certain ragas, like the komal Gandhar (flat third) in raga Darbari.

In this paper an attempt is made to ascertain the validity of this assumption with an empirical case study of intonation of komal Dha (flat sixth) in five different ragas, viz. Darbari, Bhairavi, Puriya dhanashri, Jaunpuri and Bhairav, performed (one after the other) by the same vocalist.

Although our results validate the presence of microtonality in Indian music they provide evidence for flexible intonation, ruling out the notion of pitch as fixed points. The influence of melodic context on pitch is also clear from this study. The present meaning of shruti seems more related to melodic shapes (ornamentation) and melodic context.

Introduction

In previous research (reference) we have suggested that *shruti* is not really about pitch, contrary to what many scholars have maintained for over a century. Instead, *shruti* is a melodic contour, a carefully sculpted shape of tonal space that we have referred to as a *toneme*. In this paper we have once again validated this concept.

Some time back Pt. Umakant Gundecha made a very compact demonstration of the different ways *komal dhaivat* is rendered in five different *ragas*: Darbari Kanada, Bhairavi, Puriya dhanashri, Jaunpuri and Bhairav. It is not easy, and perhaps somewhat unnatural to show the differences between these *ragas* in a quick succession. The normal situation is that one *raga* is performed for an extended time and this gives the artist the opportunity to be entirely concentrated on that *raga* alone and bring out the appropriate ethos (*ragabhava*). As such, a brief demonstration may not give the perfection and intensity that can transpire in a full length recital. In a full recital musicians really dig in to those tricky notes that we call *shrutis*. The perfect rendering of them is one of the great pleasures and values that make *raga* performance so meaningful and aesthetically satisfying. Anyway, Pt. Umakant is a very competent *dhruvadiya* of the Dagar-bani and quite confident that he can render these notes in the appropriate manner, even in such a short demo. Considering ourselves competent and keen listeners, who have had long and thorough training under great masters of Hindustani music, we feel that the demo clearly shows the different ‘sound’ of *dhaivat* in these *ragas*. At least, we can immediately recognize the *raga* being sung and that, in the end, is the proof of the pudding.

Darbari Kanada and Bhairav are particularly notorious as *ragas* that have highly specific and difficult note treatment - the first for *Ga* and *Dha*, the second for *Re* and *Dha*. All of these notes

require *andol*, a very slow and subtle oscillation, theoretically in combination with a slightly lowered pitch, known as *ati komal*. Jaunpuri's *Dha* is also known to have a very unique rendering.

Analysis

The demo contains a number of clear renditions of the *komal dhaivat* in each *raga*; two in Darbari, four in Bhairavi, three in Puriya dhanashri, two in Jaunpuri and two in Bhairav. Apart from these full renditions the note may occur rapidly, instances that we have left out of consideration. We have made graphic representations of a number of these *dhaivats* shown in figure 1 using PRAAT software from Amsterdam University. With the same software we made tonagrams to be able to see the distribution of pitches used in each sample.

At first sight there is very little difference in intonation of *dhaivat*. This is confirmed also in the average measurements:

Bhairav	809
Bhairavi	810
Jaunpuri	819
Darbari	811
Puriya dhanashri	804

Table 1: averages of *Dha* in cents.

In the often referred to theories of Clements, Deval, Daniélou and Bose, we would expect the *Dha* to be 792 cents if it would be *ati komal* (the harmonic minor sixth) or 814 cents if it would be a normal, pythagorean *komal dhaivat*. In Bhairav, Bhairavi, and Darbari it seems to be closer to the higher position of 814 cents, which would not tally with the common belief that Bhairav and Darbari have *ati komal dhaivat*. In Jaunpuri it even goes up to 819, a pitch unknown to music theory. The *dhaivat* of Puriya dhanashri seems to be right in the middle, as such representing a kind of temperament. Though it is often claimed that Indian music does not use tempered intervals (and that therefore the harmonium is a nono), this is contradicted by many measurements.

If we look at pointed measurements of the highest and lowest positions of *Dha* in the different *ragas* we get the following information:

Bhairav	796	828
Bhairavi	805	823
Jaunpuri	803	835
Darbari	801	826
Puriya dhanashri	793	811

Table 2: upper and lower limits of *Dha* in cents

Though the differences are not very striking it is noticeable that in Bhairav, Darbari and Jaunpuri there is a wider range than in Bhairavi and Puriya dhanashri. If we look at the melodic lines (figure 1) of Bhairavi and Puriya dhanashri this is confirmed. Both have a *Dha* that is very 'straight', with an occasional 'hump'. On the contrary, Bhairav, Darbari and Jaunpuri have very clear undulations. The tonagrams (figure 2) confirm this; the *Dha* in Bhairav is the most 'spread out', with Jaunpuri and Darbari in second position, while Bhairavi and Puriya dhanashri have sharp and compact peaks.

It is however when we listen carefully to the fragments and compare these to the graphs it becomes obvious that pitch as such really isn't the decisive factor. In Bhairav the *dhaivat* is

attacked from above, in a convex shaped *mind* that seems to descend fast in the beginning but opens its parachute before reaching *Dha*. As soon as it hits the ground it bounces back up ever so slightly and then slowly lands. Before going to the next level - *Pa* - there is a slight hump upwards. In fact, we hardly hear this, though it is very visible. Apparently a small rise before the final descent is necessary as a last farewell to *Dha*.

The Bhairavi *dhaivat* is pretty straight and just ever so slightly above the tempered position. This is noticeable in both the melograph and the tonagram. In the second instance there is a hump in the middle, and two smaller humps. These are barely audible and can be ascribed to vocal irregularities that occur in every voice (and become more apparent in straight notes).

The Jaunpuri *dhaivat* has some similarity to Bhairav in that it comes from above and has a certain wave motion. However there are considerable differences too. First, the starting point lies somewhere between *komal Ni* and *shuddh Dha*. Secondly, the overall intonation is higher, which is visible in both the melodic line and the tonagram. Third, the waves are more jerky, less round.

Darbari's *Dha* is very peculiar. It may either creep up from *pa* and then undulate ever so gently - usually two or three times, or it may be attacked from above as in S' N\D N\P. However, in this recording we have only the first approach.

Finally, in Puriya dhanashri *Dha* itself is quite similar to that of Bhairavi. However because of the different environments we can distinguish them quite easily. In Bhairavi the adjacent notes are *komal Ni* and *Pa*, whereas in Puriya dhanashri they are *shuddh Ni* and *tivra Ma* (though *Pa* can also appear).

Conclusion

This very interesting and beautiful rendition of *dhaivat* in five different *ragas* by an expert musician shows evidence for flexible intonation, ruling out the notion of pitch as fixed points. It reveals that not pitch itself but pitch contour is the deciding factor in making the *shutis* truly 'heard'. The influence of melodic context on pitch is also clear from this investigation. The distinct 'sound' of certain characteristic notes in certain *ragas* like Bhairav, Darbari, Bhimpalasi etc. cannot be described with the 'just' intonation interpretation of the ancient tuning system as described by Bharata. But neither should we describe them as 'mere' ornaments (*gamakas*). The very concept of ornament implies that something is 'added' to a basic structure, whereas here the add-on is the essence itself. It is not an ornament that is superimposed on the note *dhaivat*, but rather a transformation of *dhaivat* itself leading to a characteristic melodic shape within a particular melodic context.

It has been noticed that some intonations appear not to be 'just' in any way, but rather some sort of temperament. We conjecture that when there is no reason to 'choose' between the lower or higher position of a note (as in the case of *Ga*, that is strongly forced to the low position of the *svayambhu gandhar* of *tanpura*), that it may drift to a middle position.

Further research

In this study we have taken for granted that the musician is completely reliable and authoritative and that we as authors are competent and well trained listeners. From this dual perspective we have looked closely at the graphs and tonagrams, attempting to link these to what we actually hear. Obviously, it would be interesting to see how other musicians render *Dha* in these *ragas*, and how other trained listeners perceive *Dha* in these *ragas*. As usual, we have looked only at the pitch contours of the melody, while timbre and dynamics might play a role. One way would be to let the computer hum the melodic line - which would eliminate the timbre and volume variables. Nonetheless, finally we need to have a more comprehensive model including these aspects in relation to the temporal axis to describe intonation in the contemporary *raga* performance.

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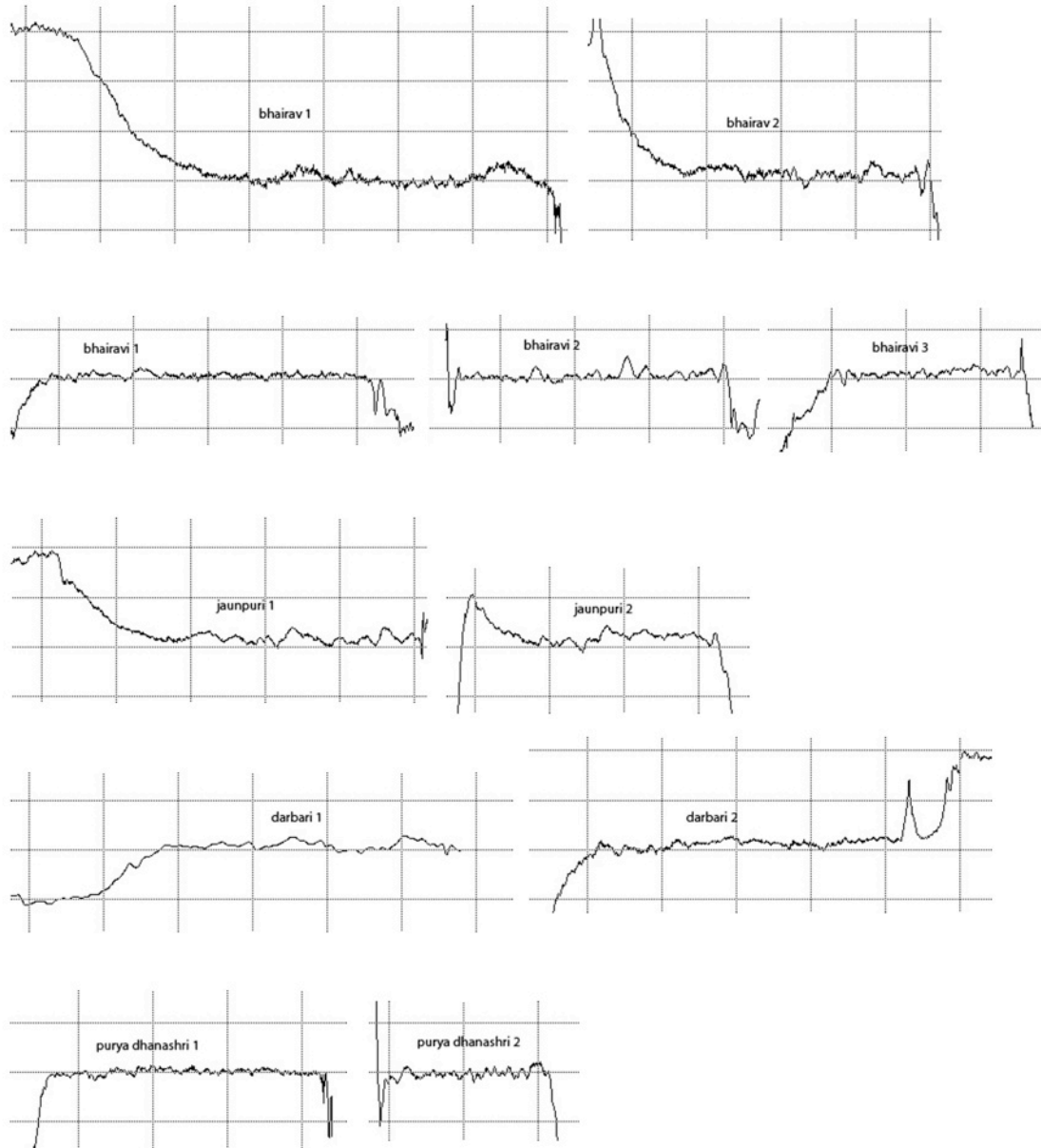


Figure 1: Melodic contours of *Dha* in five ragas

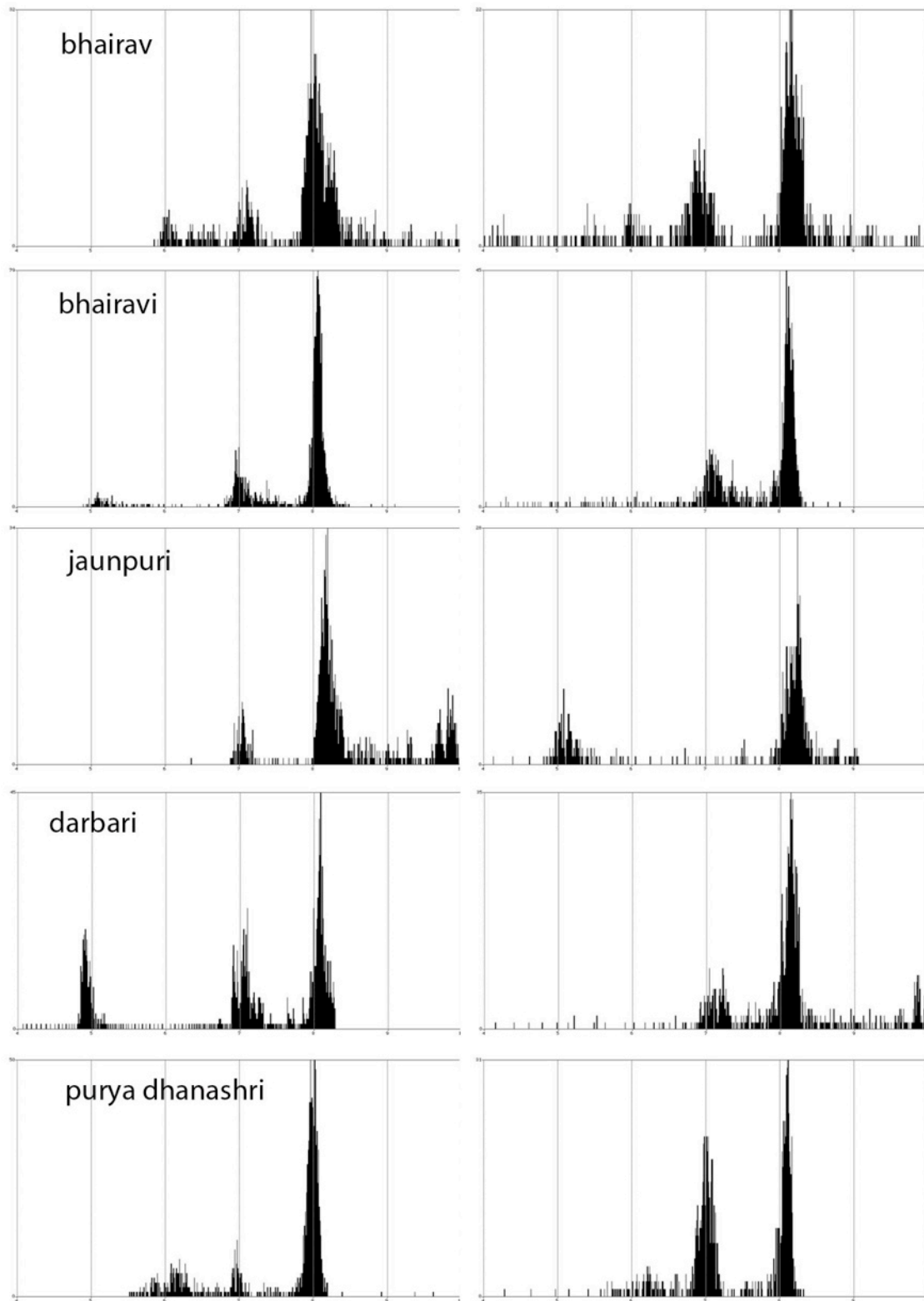


Figure 2: Tonagrams of *Dha*